Spatial and Temporal Quantification of Pesticide Loadings to the Sacramento River, San Joaquin River, and Bay−Delta to Guide Risk Assessment for Sensitive Species

#0060

Technical Panel Review

Proposal Name: Spatial and Temporal Quantification of Pesticide Loadings to the Sacramento River, San Joaquin River, and Bay−Delta to Guide Risk Assessment for Sensitive Species

Applicant Organization: California Department of Water Resources

Principal Lead Investigator(s):
Messer, Dean

Amount Requested: $395,700

TSP Panel Summary of Findings:

The project proposes to address a complex question (the spatial and temporal distributions of loadings of selected pesticides in a very extended region including the Sacramento and San Joaquin rivers and the Bay−Delta) using data from a variety of sources (some of which will inevitably be of questionable quality), and models that are still in their developmental stages. Moreover, when it is finished we still wonder if the right pesticides were chosen for the study, whether there are synergisms operating, whether key habitats were identified, and whether the models are sufficiently predictive under a variety of meteologic and temperature conditions. Nonetheless, the panel (and at least one external reviewer) agreed that the project is the next "necessary step" in the study of this subject, and a pilot study having already been completed, success may yet be achieved. Moreover, the project seems to have the support of key state and federal agencies (although only one letter of support is included) who have helped with the proposal and will serve on an advisory panel, which is essential since these agencies have experiences, study momentum and crucial data sources that the project will require. Likewise, Waterborn Environmental, Inc. the firm that developed two of the models that will be used in this effort, is the principal subcontractor on this project, which could be a benefit. The panel recognized that this project is essentially the use of CALFED funds for a DWR project, with insufficient amounts of matching funds and cost

sharing, and with about 65% of the grant funds going to one external contractor (WRI) and a sizable fraction of the rest to U.C. Davis. The panel found that there was not an adequate discussion of the budget. Reservations were expressed about who would actually be performing the work, and who would provide overall project oversight and pull findings together into a final recommendation. Another shortcoming identified is the lack of literature of the participants within their bibliography. However, even with these reservations, the panel agreed that this is a well laid out, timely, CALFED-relevant project that needs to be done.

Relevance to PSP Topic Areas:

High

TSP Technical Rating:
Superior

TSP Funding Recommendation:
Fund

TSP Amount Recommended: $**395,700**

Conditions:

External Technical Review #1

Proposal Title: Spatial and Temporal Quantification of Pesticide Loadings to the Sacramento River, San Joaquin River, and Bay−Delta to Guide Risk Assessment for Sensitive Species

Proposal Number: 0060

Proposal Applicant: California Department of Water Resources

Purpose

Comments	**The goals of this proposal are clear and strait forward. The spatial and temporal loadings of pesticides are critical components for understanding dose−response relationships in fish, wildlife and humans. This is very timely appearing to represent the logical next step following the long series of previous work done on this system. The information generated by this study is extremely likely to provide novel information with impacts reaching outside of the study area and the state.**
Rating	**Superior**

Background

Comments	**The conceptual model is clear and adequate. The provided background is well researched.**
Rating	**Above Average**

Approach

Comments	**The approach is very well designed and appropriate for meedting the objectives. The roles of the individuals involved in this project are clear and well outlined. The products are of extremely high value the understanding the role of pesticides in the regional environment. Dissemination of the information targets the scientific community, it would be nice to have incorporated a method for dissemination of the**

	information to the general public so that they understand why these things are important. An educational component such as this, even if only a simple website would be a great addition. Regardless, I think that their plan is adequate.
Rating	Above Average

Feasibility

Comments	The approach is fully documented and I am very confident that the attain their goals. I estimate the liklihood of success as 99%. The scale is a landscape/watershed level approach and completely appropriate for this kind of an investigation.
Rating	Superior

Budget

Comments	no comments, everything is in line with expectations.
Rating	Above Average

Relevance To CALFED

Comments	The proposal driectly addresses three of the four four topics addressed in the PSP: Environmental Water, System esponse to a Changing Environment, and Habitat Availability and Response to Change. An important type of environmental change is the degradation of habitats in response to contaminants and pollutants.
Rating	Superior

Qualifications

Comments	Messer has the strong record of experience necessary to undertake a project of this sort, although he appears to have a short publication record. If his publication record is larger than this, he should have indicated the total number of publications he has produced in his career and then he should have listed

	recent and relevant publications. As it is, there are two publications in Stormwater, a dissertation (which should not be listed as a publication), an interim report, and what appears to be a technical paper. How many of these are peer reviewed? This is directly relevant because the proposal suggests that SETAC is a major outlet for dissemination of the products, yet there is no evidence that any publications have ever appeared in their primary journal. There is no mention of publications of any kind in any of the investigator biographies. This is a major problem. It is incumbant upon the proposer to show the ability of the team to do their jobs. I see no real evidence that any of these people can publish or will present at meetings. I am certain that if I get on the internet I could look these people up and find out, but it is not my job to provide evidence that the investigators can fulfill their goals. I have only moderate confidence based on the investigator descriptions. Publication and presentation of results is one of the most important areas of research. Until they have been completed, the research has not been completed. This is a major problem with this proposal. I am listing this as suffient because I am giving them the benefit of the doubt.
Rating	**Sufficient**

Overall Evaluation Summary Rating

Comments	**I am entirely satisfied with everything about this proposal except that the descriptions of the investigators are inadequate. It is difficult to believe that someone can spend 20 or 30 years without producing at least gray literature, but the proposers provide no evidence of their ability to publish the information so others can access it.**
Rating	**Above Average**

External Technical Review #2

Proposal Title: Spatial and Temporal Quantification of Pesticide Loadings to the Sacramento River, San Joaquin River, and Bay−Delta to Guide Risk Assessment for Sensitive Species

Proposal Number: 0060

Proposal Applicant: California Department of Water Resources

Purpose

Comments	**The basic hypotheses are that "models can be used … models have the ability to … models can be used to…" answer many questions about pesticides in this important watershed. The existing data sets, GIS capabilities, and monitoring data provide excellent data and constraints on the models that are going to be generated by this research. Pesticide loading to the rivers and estuary are important now and with become more important as the future brings a multitude of problems (i.e., seasonal extremes increase; climate change occurs; pesticide usage increase with attempts to fight West Nile and other invasions threats; and population growth brings suburban sprawl to farm land). The project is a necessary step in understanding spatial and quantification of pesticide loadings. Because the bulk of most watershed assessment is in the gathering and interpretation biotic and water quality data there is a good data base for this modeling study. As the authors clearly point out there is a need for modeling that will add to the base of knowledge and assist the biotic and water quality studies. The study appears to be a scale up from smaller pesticide model studies. This scale up will develop methodology that is transferable to other large watersheds.**
Rating	**Above Average**

Background

Comments	**There has been extensive pesticide loading for a very long time to the rivers and estuary. There is a decline in pelagic species in the delta. The underlying basis for the project is clearly described in the proposal. Relevant studies are well described.**
Rating	**Above Average**

Approach

Comments	**The approach is to use existing models and data to construct four sets of model simulations. Each step is designed to build on the first step with the first step based on previous studies it should work. Questions do occur. What is the rate of none reporting to the Pesticide Use Reporting (PUR) database and it is large how will it tilt the modeling results? Are they in step three of the models into the future include a range of possible climate changes coupled with heavy pesticide attacks of West Nile virus? On the other end will they be able to model using declining pesticide applications (conversion of farmland into housing) with known half-lives of today's and yesteryears pesticides?**
Rating	**Above Average**

Feasibility

Comments	**The models are well developed and direct appellation to answering critical questions. The proposal fully furnishes descriptions of relevant previous model work. It is feasible to do this project but it is a huge step in complexity with such a large area and unknown aspects for the future. Given two years, this budget, level of support, and their experience they should be able to do this project.**
Rating	**Superior**

Budget

Comments	The budget is reasonable. They have done a good job of working up the tasks and salaries. What worries me is that there is not going to be any flexibility in the budget if unexpected problems or the results themselves need further development before the final stage in the grant must occur (publication and dissemination of results). However, they are modeling so we should expect no problems that might crop up in a watershed assessment.
Rating	Superior

Relevance To CALFED

Comments	The proposal is relevant to CALFED. The combination of GIS and modeling applied to watershed assessment, fish, and climate change is important. After the project there should be a nice interaction and continued feedback between watershed assessment (i.e., need for new water quality and bio stations) and the modeling. The proposal is heavily dependent on existing data for constraints on the modeling.
Rating	Superior

Qualifications

Comments	Some of the people developed and/or have direct experience in the models that are at the center of this research proposal. Other than picking the parameters to model (i.e., picking the pesticides) for this study the authors have everything laid out and ready to go. This group has an excellent track record.
Rating	Superior

Overall Evaluation Summary Rating

Comments	Models coupled with GIS representation of data in a watershed are important parts of watershed assessment,

	correction of environmental problems, and determination of potential problems. This proposal fits my view of how continuous or long−term watershed monitoring can be aided by proper modeling. As long as we all remember that all approaches (GIS, modeling, watershed assessment) are tools that together build our understanding (in this case pesticides in the hydrosphere and biosphere) of human (pollution) modification of natural environments we will advance the science. Why rate the proposal as superior? They are clearly experts in modeling with enough experience to complete the proposal within time and budget, they are going to produce a range of models (stages up to and including future global climate change effects on the study are) and their results will offer opportunities for judging future human usage of pesticides that could make the situation better or worst.
Rating	**Superior**

External Technical Review #3

Proposal Title: Spatial and Temporal Quantification of Pesticide Loadings to the Sacramento River, San Joaquin River, and Bay−Delta to Guide Risk Assessment for Sensitive Species

Proposal Number: 0060

Proposal Applicant: California Department of Water Resources

Purpose

Comments	**The objectives and hypotheses are well described and consistent. The concept of the proposed study could be highly useful for obtaining an understanding of pollutant loading, transport, and fate in this system, and I am surprised this effort hasn't been done sooner. A full scale implementaion is justified.**
Rating	**Superior**

Background

Comments	**The conceptual model and background are well described, at least sufficiently to understand the basis for the study. The approaches and methods are somewhat standardized for this sort of study, and are not difficult to understand from the description presented.**
Rating	**Superior**

Approach

Comments	**The approach is well designed, and is fairly straightforward and conceptually standardized in this research field. The personnel and institutions involved are appropriate for this study. The resulting databases and results should be extremely useful not only in meeting**

	the objectives of this study, but also to other researchers doing related projects in the CALFED program. My only concern is that response of fish species is emphasized, and that the effects on some critical arthropod species (such as mysids and copepods) that are the principal forage species for fish in their early life stages is also necessary.
Rating	Superior

Feasibility

Comments	Similar studies have been performed in many other programs. The models are fairly well developed and have given useful information in those studies, so the liklihood of this study being successful is high. Any technical obstacles should be solvable by the assembled project team. There are no significant technical or methodological hurdles to overcome.
Rating	Superior

Budget

Comments	The budget appears reasonable, especially since much of the data already exists, and the models are already available (it would be insufficient if either new data needed to be collected in the field, or if new models needed to be developed).
Rating	Above Average

Relevance To CALFED

Comments	Priorities are well addressed, and the study addresses one of the more critical issues in this system. The modeling of pollutant fate and distribution is critical for understanding a wide variety of environmental effects. The results of modeling, as well as synthesis of data into useable databases for other modeling efforts, should be highly useful to managers and policy makers for this system. I hope

	that the databases established by the study (as well as model results) are made available online so that other researchers (and managers) can access them easily, especially in GIS-ready format.
Rating	Superior

Qualifications

Comments	Although I am not familiar with the details of the past work by these investigators, the description of qualifications suggests to me that the individuals and agencies and institutions are well qualified and positioned to carry out this study.
Rating	Superior

Overall Evaluation Summary Rating

Comments	This appears to be a well thought out and highly useful and relevant study. Modeling of this sort is not only useful for understanding current phenomena, but is the only efficient way to investigate the consequences of alternate or future scenarios. If conducted properly, the resulting information should be very useful and important, and contribute significantly to our knowledge of this sytem.
Rating	Superior